Developing 'Science' and 'Wind': Eighteenth Century Sports Training

During the eighteenth century the English economy underwent an accelerated structural transformation during which a combination of industrialisation, rapid urbanisation and population growth, created an environment for entrepreneurs to exploit. The response from leisure providers in many emerging cities, especially London, was dynamic with burgeoning numbers of coffee-houses, theatres, assembly rooms, circuses, lending libraries, and music concerts, all supported by a local press which carried regular advertisements. Inn landlords, anticipating profits from the sales of food and drink, were prominent in promoting cock-fighting, bull-baiting, horseracing, dancing contests, and games of skill and strength, while sporting facilities accommodated the needs of both participants and spectators. Entrepreneur George Smith promoted foot racing and cricket at the Artillery Ground while Thomas Higginson, offered fives and racquets at his Fives Court in St. Martin's Street, and tennis at courts in the Hay Market and High Holborn where there were also two billiard tables. The Peerless Pool, behind the bowling green in Old Street, was converted in 1743 by William Kemp into a pleasure bath where waiters attended to teach swimming. By 1725, Bellsize House was operating as a pleasure garden where visitors could dine in the restaurant, listen to musicians and dance in the ballroom or fish, hunt deer, foxes or ducks, and bet on horses or pedestrians. In August brickmaker James Deal raced drover Paul Harrison nine times around the Park for twelve guineas aside. By 1731 the demand for pedestrianism was such that three heats of six times around the course were being advertised with five guineas for first place. Entries included the Yorkshireman that had won the last competition plus Thomas Woodcock, George Oliphant, a butcher, William Huggins and several running footmen 'belonging to nobility'.

The rougher sports of the lower classes were also contained and packaged for financial gain. There were already some specialist facilities at the start of the century such as Preston's Amphitheatre in Clerkenwell where diversions included wrestling, boxing, cudgelling, quarter-staff, and bear-baiting. The Amphitheatre was surrounded with benches and in the middle of the arena was a large stage for the human fighters, men like James Figg, James Stokes and John Broughton, all of whom subsequently promoted boxing through their amphitheatres and then capitalised on their reputations by running teaching academies. Figg is credited with being the first to specifically commercialise boxing after he established a School of Arms in Tottenham Court Road in 1719. In 1734, George Taylor acquired the amphitheatre and enjoyed considerable success as a manager and showman with a day's takings sometimes reaching £150 (£12,000+). The best remembered of these entrepreneurs was Broughton whose contribution was significant, not only for his development of refined hitting techniques and defensive tactics but also for his introduction of rules in 1743 and for providing mufflers, protective gloves, at his teaching academy.

Foot-racing and leaping developed alongside boxing although there were important distinctions between prizefighting and pedestrianism. Gentlemen might participate directly in pedestrian matches but not in prize fights, although they supported and financed fighters. Before gate money became an important factor in sports promotion the money for prizes, purses and training expenses came from backers and patrons who retained athletes specifically for the purpose of making profitable matches. As commercialisation and the preoccupation with gambling combined to influence the development of modern sport, these professionals were in increasing demand and by the end of the century the freelance professional was as common as the hired man. Many of these men extended their sporting careers by adopting training roles upon retirement when they drew on their own experiences, contemporary medical and scientific knowledge, and an existing oral tradition surrounding training, to devise their regimes.

Another factor in the development of systematic training programmes was the reassessment of traditional ideas relating to the body during the Enlightenment when the notion emerged that the application of science-based knowledge within training schemes could enhance the performance of humans beyond their God-given abilities. In addition, increasing industrialisation brought with it an emphasis on achievement through improved performance and further stimulated the emergence of specialist trainers such as Figg, who took responsibility for one fighter's 'Instruction and proper Diet' before a contest in 1725. Thirty years later it was being argued that a rapidly expanding competitive programme would lead gentlemen 'to keep champions in training, put them in sweats, diet them, and breed up the human species with the same care as they do cocks and horses.' Tellingly, the author believed that, as a result, this 'branch of gaming would doubtless be reduced to a science' and gambling had much to do with stimulating training regimes. Backers who matched Perrins with Johnson in 1789 were prepared to wager up to £20,000 (£1,000,000+) before they put Perrins into training.

The constant search for improved performance resulted in the development of training practices, a refinement of skills instruction, and the systematic selection of talent. These initiatives were reflected in instruction manuals. Wrestling was covered in detail by Parkyns in 1713 who considered fitness, diet and technique, analysed with mathematical and theoretical principles which he credited partly to his association with Isaac Newton. Parkyns selected men of a middle size, athletic, full-breasted, broad shouldered, brawny-legged and armed, for wind and strength. If he liked a man's size and complexion he first asked if his parents were still alive and, if not, at what age they died and then he explored their medical history and lifestyle, rejecting libertarians and men used to soft living. He also rejected 'sheep-biters' in favour of beef-eaters, who he believed had more robust, healthy and sound bodies, and he advised pupils never to exercise on a full stomach, to avoid excessive alcohol, and to take only enough liquid to maintain the body's equilibrium and strength. Further suggestions were offered on the treatment of injuries with particular advice that sprains of the joints and tendons should be treated with cold water. For Parkyns wrestling was both an Art and a Science and the more a wrestler exercised and practiced the more those experiences would develop his understanding of the sport.

Boxing manuals identified and assessed the disparate elements required for competitive performance. It had been observed in 1720 that it was not always the stongest man but the one with the 'longest breath' who would be successful, and authors clearly distinguished between the acquisition of technique, 'science' or 'art', and fitness or 'wind'. Godfrey observed in 1747 that while strength was needed a boxer would not succeed without art although other authors considered strength more important even though every fighter required some knowledge of the science. For Fewtrell strength, art, bottom (courage), activity, a quick eye and wind, were the constituents of a complete boxer although art was critical. He applied his analysis to his contemporary, Johnson, whose greatest asset was that he always studied his opponents' strengths and weaknesses and used this knowledge to his own advantage. Other pugilists might be superior in strength, science, and bottom, but in Johnson these abilities combined to form a complete boxer. In 1799, *An Amateur* took this kind of analysis further and produced a comparative table of contemporary fighters.

Although there were differences in the level of importance allocated to the various aspects of performance there was agreement that while some characteristics were naturally endowed others, especially 'scientific' skills, could be improved by frequent practice. The mechanisms explaining the complexity of human motion had already interested scientists and Swammerdam had shown in 1658 how to contract a muscle by simple irritation. In 1666, Redi was the first to deduce that muscles generate electricity and Dufay later observed that the muscles of all living bodies produce electricity during motion. Between 1680 and 1681, Borelli, considered a pioneer of modern biomechanics, studied running, jumping, and skating. This process of instrumental rationalisation of the human body and its movement was linked, in part, to the industrialisation of the workplace and began with Descartes' *A Treatise on Man* in 1664, ideas further developed with the biomechanical paradigm created by Borelli in 1685. For London residents scientific courses were widely available at the start of the eighteenth century. In 1702, George Willson was presenting a public chemistry course at his laboratory in Smithfield, Mr. Harris's public mathematics lecture at the Marine Coffee house in October 1705 included the principles of 'Mechanick Philosophy', while professional anatomy teachers lectured to anyone who bought a ticket. For those who wanted to appreciate anatomy without attending a dissection there were anatomical waxwork exhibitions such as Rackstrow's in the Strand. Sporting entrepreneurs also appealed to this Enlightenment passion for science.

Fundamental to scientific boxing was knowledge of human anatomy. Godfrey observed that a man's strength came from his muscles and that this strength could be improved by the application of technique. Muscles which 'by nature designed for different offices, mutually depend on each other in great efforts' were springs and levers which executed the different motions of the body but skill gave them additional force. The nearer a man brought his body to the centre of gravity, the truer the line of direction would his muscles act in, and consequently with more force. The centre of gravity was also crucial in establishing a 'true equilibrium' of the body which would allow it stand firm against an opposing force, a position which depended on the proper distance between the legs. Advancing the left leg brought the left side toward the adversary which enabled the right-handed man, having stopped a blow with his left arm, to exert greater power when stepping in with his right hand. It was evident, therefore, that a proper understanding of the art could make skilful men far superior to stronger men.

Fighters were also familiar with the most effective target areas. The blow under the ear between the angle of the lower jaw and the neck was believed to force blood both into the head, causing a loss of sensation and bleeding, and backwards into the heart leading to a cardiaca. The 'mark', the pit of the stomach, was especially vulnerable since a severe blow here lessened the cavity of the thorax, thereby causing difficulty in respiration. Blows between the eyebrows caused blood to fall immediately into the eyelids, completely hoodwinking the victim. When Hunt beat the much heavier Slaughter-man in 1787 he 'directed every blow at the eyes, and won by completely sealing them up'.

Fewtrell argued in 1790 that little more remained to be done to improve the science. No 'labour, no expense had been spared to attain perfection and every manoeuvre, every finesse, which the mind could suggest, or the body execute, had been attempted'. It was this appeal to science that made the sport palatable to those who considered it 'cruel and unmanly' to like to see men 'ignorant of boxing beat each other to pieces'. The pleasure in watching a good fighter came from observing 'that done with ease which a man unacquainted with the science would find it impossible to effect'. This science was considered in detail within boxing manuals. The advance, for example, was broken into three steps, the brace, the throw, and the square, called the bar movements, which were practised assiduously often to the beating of time. Other authors dealt with how to anticipate an attack and the benefits of analysing an opponent's style, skills and strengths. It was particularly important to look an opponent in the face while taking his arms 'within compass of your view' since the motion of eyes and hands would warn of where he was about to strike. One writer concluded that discipline, reduced to general maxims and rules, rendered the art 'easy and intelligent' and that 'Sleight in this science will accomplish what strength and resolution cannot'.

Practice was essential to ensure a perfect knowledge of the science and should never be neglected. A mirror would enable a man to strike the right poses and to practice lessons. The same use could be made of a candle, by standing between its light and the wall, on which a man's shadow might be observed. Boxers could practice by striking straight forward with each arm successively, possibly using dumbbells to improve the capacity to strike more often and more quickly, while sparring, which allowed a man to unite practice and theory, was the most important means of trying out new strategies as well as exercising.

While technique was developed in the boxing schools and academies, the attributes of wind, activity, and bottom, were improved through training regimes under the supervision of expert trainers. The use of exercise, 'an agitation of the body…which produced salutary effects', and specific training was nothing new, as suggested by Stubbe's observation in 1671 that bodies which were dieted and brought up to an Athletick habit, do 'soonest of all decline into sickness and premature old age', and in 1725, Cheyne outlined in his *Essay of Health and Long Life* many of the basic tenets. He emphasised the importance of the 'non-naturals' of air, meat and drink, sleep, exercise and rest, evacuations and their obstructions, and the passions of the mind. His advice included giving more food to those involved in hard labour, avoiding going to bed on a full stomach, always ensuring full evacuation of the bowels with one regular stool a day, and walking as the most useful exercise. He also observed that the legs, thighs and feet of chairmen, the arms and hands of watermen, and the backs and shoulders of porters grew thick and strong and concluded that 'Using any organ frequently and forcibly brings blood and spirits into it and so makes it grow plump and brawny'. He proposed four conditions necessary for beneficial exercise. It should be carried out on an empty stomach, it should not be carried out to a depression of spirits or a melting sweat, post-exercise recovery should be in a warm environment, and participants should avoid over exertion. He also recommended cold bathing and the flesh brush as a means of promoting perspiration and circulation. Training advice offered throughout the eighteenth century drew on these basic principles along with the accepted medical knowledge of the period which remained centered around humoral theory. Bodies were comprised of the four humours of earth, fire, water, and air, each having its associated characteristic of melancholy, choler, phlegm, or blood, and the trainer's task was to identify humoral imbalances in athletes and then redress them through diet, exercise and medication.

A man was considered to have good wind when he displayed an ability to maintain activity and there was unanimity that wind could be improved by regular and specific training. In 1726 one writer emphasised that individuals should not pass immediately from a 'disordered kind of life' to a strict exercise programme but should do it gradually since doctors believed that it was dangerous to abandon a man's traditional lifestyle. He also drew attention to the appropriate methods of preparing the body, declaring that the body should be well purged and cleared of all ill humours by gently taking medicines over two or three days. The first day

purged the bowels, the second the liver, and the third the 'reins' in which lay the 'drain' of the ill humours. As to diet, beef gave strength to those who were physically active enough to digest it properly, while the best ale was clear and well brewed. Other dietary advice proposed bread along with beans, peas and lentils, although their constant use could cause obstructions. Fish was the least nourishing animal food while rich, sweet puddings, especially baked, and fruit after meat were 'unnatural and improper'. Water was essential for life but too much of it relaxed and weakened the solids and it should not be drunk cold when the body was hot. Perfect digestion was always the best rule especially if one was planning to be particularly active after a meal.

Training took athletes from their usual routines and put them under the control of experts for periods of time that differed according to the authority consulted. Following Slack's challenge in 1750 Broughton noted that since Slack had been 'in keeping' for some months and he himself was not immediately prepared he needed a month's training. Other suggestions ranged from ten days to at least six weeks and since it was generally accepted that best quality air was to be found in rural areas, trainers normally took their men out of towns. When 'in training' contestants lived with their trainers, who supervised all aspects of their daily lives and whose success was ultimately assessed not only in terms of the final outcome but also in relation to a contestant's physical appearance and the 'ceremony of peeling' before a sporting contest was often a spectator's first clue as to the condition of the athlete. On peeling before his fight with Humphreys in 1790, Mendoza appeared the 'largest and heaviest man; a circumstance arising partly from his increase in bulk, and partly from the mode of training adopted by Humphries, apparently more for the purpose of rendering him light and active than of adding to his weight'.

In 1788, *An Amateur* described a standard disciplined training programme for the period, one regarded as having been 'laid down and approved by many scientific men' and one that emphasised the dietary rather than the exercise regime, although there were attempts to address the psychology of the athlete who should be entertained, if possible, with martial music before going to bed. This would help a man form an 'heroic state of spirits', make his dreams agreeable, and add to his 'vivacity and serenity of thought'. The mind must not be 'ruffled or agitated' but everything should be conducted with 'harmony and liveliness'. Mendoza proposed that men should live temperately, taking exercise, but not so much as to prove fatiguing. Men should train in the country, going to bed about ten, rising about six or seven, having a cold bath if possible, followed by a dry rub, some muscular exercise, and a walk of a mile or two. After a good breakfast, they should take the air again, then practice sparring and any other moderate exercise until dinner. Beverage at dinner should be wine and water, and a glass or two of old hock. The afternoon should be spent riding or walking and a supper taken of any light nourishing food about eight after which the man should exercise again, maybe utilising dumbbells, until retiring to bed. The fighter and his trainer were advised to take care to avoid excesses in food, wine, or women.

Godfrey advised fighters to avoid too much aliment on the day of combat, because their stomachs would be more susceptible to blows if distended with food, and to restrict their intake to a little cordial water, which would be helpful in 'astringing the Fibres, and attracting it into a smaller Compass'. Others suggested eating no more than a single slice of bread, well toasted without butter, or a hard white biscuit toasted, and about a pint of best red wine mulled, with a tablespoonful of brandy in it, to be taken an hour before dressing. On the stage, drinks should consist of Hollands, bitters, and Fine China orange juice, with some lump sugar dissolved, mixed to a strength suitable for the individual.

By the end of the eighteenth century the science of manly defence had become an integral part of a gentleman's education and boxing schools were established by a number of practicing prizefighters, many of whom also embarked on careers as trainers. While the term 'science' had been used in conjunction with sporting activities throughout the century and while training had been undertaken by professional athletes for at least as long, it was only now that contemporaries believed a full understanding had been achieved of the importance of 'wind', 'bottom', and 'science'. There was general agreement about the key content of training regimes and as this cadre of sportsmen extended their sporting interests, many pugilistic training methods became the standard modes of preparation for other gambling focussed activities such as rowing and pedestrianism. This training lore displayed considerable longevity, underpinning practices across all professional sports for much of the nineteenth century, partly because it proved to be extremely effective in developing athletes well beyond the normal capacities of their contemporaries and a leading article in the medical journal *The Lancet* observed that pugilists had been 'brought into a condition capable of the greatest

physical exertion and endurance' as a result of their training regimes. In 1789, Ward was found guilty of manslaughter after being challenged by a blacksmith, a remarkably strong man and the best bruiser in his neighbourhood. They had four rounds during the last of which the blacksmith received the blow on the right temple that killed him. Two years later while Mendoza was sparring, a dragoon threw off his *mufflers*, and demanded that he box in earnest. Mendoza took off one glove and, although he only used one hand, within three minutes the man could not find his way out of the room, both his eyes being closed. Paradoxically, this level of expertise contributed to the decline of bare-knuckle boxing as expert training and refined hitting methods made the sport an extremely brutal affair. James, fighting Gamble in 1800, had his nose cut dreadfully in the fourth round, his collar-bone broken in the twentieth, his jaw broken in the twenty-first, and yet he still fight four more rounds before falling.

Pedestrian performances were also significant. Radford argues that the first four minute mile was run on 9 May 1770 by James Parrott, a costermonger. In 1787, Powell engaged himself to run a mile in four minutes and wagered 1,000 guineas (£780,000). In preparation, he ran a time trial to assess his condition and for his backers to make a decision about how they would bet with newspapers reporting that he ran 'within three seconds of the time'. Nine years later Weller also wagered that he could run the mile in four minutes and the sporting press reported that he won his wager by two seconds on 10 October 1796. It should not be assumed that distances and times were inaccurate. Specialist watchmakers provided regulated and checked watches and distances were sometimes measured with agricultural chains which were accurate for distances over 220 yards. The ground was occasionally specially prepared and since runners almost always ran for wagers under the gaze of referees it seems there was general agreement that distances and times were accurate. Analysis of nearly 600 races reveals some remarkable times over other distances. James Appleby reportedly ran 12 miles in 57min in 1730, and Thomas Phillips was only 15sec behind. Both men on other occasions were reported to have run four miles in 18min. Pinwire ran 10 miles in 52min 3sec in 1733, and 12 miles in 64min in 1738, a time entirely athletically and physiologically consistent with his 10-mile time. Since racehorses are believed to have run as fast then as they do today it is quite possible that so did athletes, particularly when they were motivated by large sums of money and took their training seriously.

At the beginning of the new century some of the oral traditions and practices of prominent trainers like John Jackson were recorded by Sinclair who observed 'the almost incredible perfection, to which those whose profession it is to train men to athletic exercises, have brought to their respective art.' His subsequent *Code of Health and Longevity* in 1807 drew further upon ancient sources, contemporary physicians, sports trainers and published manuals to explore the current state of athletic training. The regimes he described and those employed in the 1810s by men such as Robert Barclay represented a refinement, not a replacement, of the programmes offered in the course of the eighteenth century and emphasise that any form of knowledge such as sports training always occurs within a specific social and historical context and invariably builds on previous understanding and tradition. Even when training programmes changed in the later Victorian period they continued to address the key essentials of diet, exercise, psychology, and technique, as identified by these men, training elements which remain the cornerstones of athletic preparation for the modern Olympian.